JSC readies Genesis for space flight

Experiment will bring back first extraterrestrial samples since Apollo

or the first time since Apollo, JSC scientists are preparing to once again receive extraterrestrial samples from space. Genesis, a satellite that will capture solar wind particles and return them to the Earth for analysis, was recently shipped from JSC to Lockheed Martin in Denver for spacecraft installation and from there will be headed to Kennedy Space Center for a February launch.

The Genesis payload, a 32-inch diameter cylindrical canister, was manufactured by NASA's Jet Propulsion Laboratory and shipped to JSC in early July for precision cleaning. JSC is responsible for the contamination control and sample curation of the Genesis mission. As part of the contamination control process, JSC completely disassembled, cleaned and reassembled the canister. After some final functionality tests and purging the canister of nitrogen, Genesis was sent to Denver and is now one step closer to its on-orbit mission.

Genesis will be launched on a Delta II in February 2001. It will take nearly three



months for the device to reach its solar orbit entry site, roughly 1.5 million kilometers sunward where the Earth and Sun's gravity balance each other. Genesis will orbit the Sun for two years, collecting solar wind samples on ultrapure collectors, such as silicon wafers used in the semiconductor industry. Its return,

estimated for 2003, should help researchers resolve many unanswered questions about the origination of the solar system.

"The main objective of the Genesis mission is to understand the materials and processes involved in the origin and evolution of the solar system," said Eileen Stansbery, Ph.D., and JSC assistant chief,

Researchers in JSC's planetary science department ready Genesis for its mission to collect

Planetary Science. "At JSC, we already have samples of a variety of solar system objects, including rocks

from the Moon, several asteroid classes, several igneous rocks from Mars, even interplanetary dust grains. In the coming decade we will receive documented samples from a comet, an asteroid, and the surface of Mars. What is missing are samples of the starting material itself – the solar nebula. Genesis will collect solar wind samples of all elements in the periodic table and therefore the average chemical and isotopic composition of the solar system."

Flight controllers host visitors for EVA simulation

uring a recent EVA simulation for the STS-92 mission, flight controllers opened the Mission Control Center to simulation facilitators from Challenger Center organizations, providing them with a chance to see how real NASA flight controllers conduct actual, integrated mission simulations.

Challenger Centers, located all across the country, host training sessions similar to NASA integrated simulations.

"The simulations conducted at Challenger Centers have proven to be a very effective way of familiarizing the public with manned space flight operations," said NASA Flight Director Chuck Shaw. "The idea is to let them see how we conduct an integrated simulation so they can apply what they see where it makes sense for their simulations."

Numerous flight controllers in both the White Flight Control Room (Shuttle operations) and Blue Flight Control Room (International Space Station operations) volunteered to allow a Challenger Center visitors to join them at the console to see and hear the process as it works during integrated

simulations. In addition, after the simulation several Flight Controllers volunteered to take the Challenger Center folks on personal tours of other activities at JSC.

The STS-92 crew was tied-in for the simulation from the Shuttle simulator as well as from in the water in the Neutral Buoyancy Laboratory as the team practiced the Extravehicular Activities that will be conducted on Flight Day 5 of the next shuttle mission. The activity encompassed connecting hardware for the Z1 Truss element.

"It was positively fascinating," said Nancy Thompson, a teacher/flight director for the Challenger Center of the Rio Grande Valley. "I was able to sit next to the Cap com and listen to her as she communicated with the astronauts in the pool. It was amazing."

Challenger Center representatives came from as far as Brownsville and Beaumont/ Port Arthur for a chance to sit in with

Thompson, like many of the other Challenger Center attendees, participated in the



NASA JSC Photo 2000-06143 by Benny Benavide

event hoping to return to their centers, and classroom, with a more accurate perspective of how Mission Control Centers operate.

"I certainly understand a lot better," added Thompson. "It made me aware of how much I don't know. This was truly an out of this world experience for me!"

Flight Director Chuck Shaw talks through his role during the simulation as Challenger Center Instructors Betty Glass and Barbara Wilson listen intently to the real-time communications with the STS-92 crew. Capcom Ellen Ochoa, far left, looks on.

Dreamtime hardware to provide high-definition video from space

nly a few months after announcing the first-of-its-kind partnership, JSC has officially received its first p of video hardware as part of the Dreamtime venture.

A high-definition, digital encoder, developed by NTT and NHK, was delivered to JSC engineers September 5. The encoder represents the first Detailed Test Objective of the Dreamtime public-private partnership. It will be flown aboard an upcoming shuttle mission and operate with a decoder on the ground to provide live high-definition video downlink from space for the first time. Currently, NASA uses standard analog transmission for its downlink video.

"This is a very important step in the NASA and Dreamtime collaboration," said Brian Kelly, NASA collaboration manager for the partnership at JSC. "It puts NASA on the cutting-edge of digital technology and is tangible proof of what can happen when NASA and industry work together toward a common goal."

JSC's shuttle and engineering teams will spend the next few months identifying any necessary modifications to the encoder to make it compatible for space flight operations.



JSC received a digital, high-definition encoder that will be used to download live video from space. Shown here, left to right, are Randy Richards, NASA; Johnnie Reid, Lockheed Martin; Ken Fisher, NASA; Ben Mason, Dreamtime; Yanagawa Koji, NASDA; John Kennedy, NASA; and Doug Holland, NASA with the encoder, forefront.

NASA announced in June its groundbreaking partnership with Dreamtime. The partnership represents a unique association bridging nation's space agency with the power of the Internet. By using the most advanced technology tools available, such as digital media, leading-edge Web design

and HDTV, the public will have easier, more complete access to space exploration and imagery.

This unique partnership will provide a gateway to NASA's incredible collection of imagery, audio and film documenting more than 80 years of aeronautical and

- · Digitizing NASA's photo, audio and it available globally via the Web;
- Upgrading NASA's multimedia equipment, at each center as well as on each shuttle and the International Space Station, with next generation HDTV technology; and
- Creating world-class film, documentary and television programming that will preserve and share the legend of America's space program with the world.

The partnership with Dreamtime provides NASA with the tools and capability to share the agency's exclusive work and imagery with audiences it otherwise could not reach. In fact, by mid-October, Dreamtime will have delivered more than 2 million dollars worth of digital technology equipment to the agency.

"Dreamtime has also provided NASA with two high-definition television cameras to document the launch of Discovery from Kennedy Space Center October 5," said Kelly. "Following that launch, technicians from Marshall Space Flight Center, Kennedy Space Center and JSC will carry the cameras to Russia and prepare coverage for Expedition One."